

IN THE CLAIMS

Please amend the claims as follows:

Claim 1 (Currently Amended): A semiconductor device comprising:
a semiconductor substrate of a first conductivity type;
a channel region formed at a surface of the semiconductor substrate;
source and drain ~~source and drain~~ regions of a second conductivity type formed at both
sides of the channel region in the semiconductor substrate;
an insulating layer covering the channel region; and
a gate electrode formed on the insulating layer,
the insulating layer containing impurity atoms in such a manner that a concentration
thereof is non-uniformly distributed along a surface parallel to the semiconductor substrate,
wherein a maximum concentration of the impurity atoms in the surface is equal to or greater
than twice a minimum concentration thereof.

Claim 2 (Original): The semiconductor device according to claim 1, wherein the
impurity atoms are selected from the group consisting of B, C, N, F, P, S, Cl, As, Se, and Br.

Claim 3 (Canceled).

Claim 4 (Original): The semiconductor device according to claim 1, wherein a
highest concentration of the impurity atom is equal to or more than 10^{19} cm^{-3} .

Claim 5 (Withdrawn): A method of manufacturing a semiconductor device
comprising:
forming an insulating layer on a semiconductor substrate of a first conductivity type;

forming a conductive layer on the insulating layer;
forming on the conductive layer a spotted layer including minute spots containing a resistive material resisting against ion implantation;
non-uniformly implanting impurity ions to the conductive layer via the spotted layer containing the resistive material; and
diffusing the impurity ions in the conductive layer into the insulating layer.

Claim 6 (Withdrawn): The method of manufacturing a semiconductor device according to claim 5, wherein the impurity ions are selected from the group consisting of B, C, N, F, P, S, Cl, As, Se and Br.

Claim 7 (Withdrawn): The method of manufacturing a semiconductor device according to claim 5, wherein the resistive material is a resist.

Claim 8 (Withdrawn): The method of manufacturing a semiconductor device according to claim 6, wherein the spotted layer is formed by applying the resist to the conductive layer, and spottedly leaving the resist on the conductive layer by performing etch back of the resist.

Claim 9 (Withdrawn): The method of manufacturing a semiconductor device according to claim 5, further comprising:

forming a gate oxide layer from the insulating layer; and
forming a gate electrode from the conductive layer.

Claim 10 (Withdrawn): A method of manufacturing a semiconductor substrate comprising:

forming an insulating layer on a semiconductor substrate of a first conductivity type;
forming a conductive layer on the insulating layer;
performing implantation of impurity ions several times so that an impurity concentration of the conductive layer becomes non-uniform due to implantation fluctuations;
and
diffusing the impurity ions in the conductive layer into the insulating layer.

Claim 11 (Withdrawn): A method of manufacturing a semiconductor substrate comprising:

forming an insulating layer on a semiconductor substrate of a first conductivity type;
forming a conductive layer on the insulating layer;
forming minute concavity and convexity on a surface of the conductive layer by etching the conductive layer;
performing ion implantation of impurity ions on the conductive layer having the concavity and convexity on the surface; and
diffusing the impurity ions in the conductive layer into the insulating layer.

Claim 12 (Withdrawn): The method of manufacturing a semiconductor substrate according to claim 11, wherein the etching is chemical dry etching.

Claim 13 (Withdrawn): The method of manufacturing a semiconductor substrate according to claim 11, wherein the etching is wet etching.

Claim 14 (Withdrawn): The method of manufacturing a semiconductor device according to claim 12, wherein said impurity ions are selected from the group consisting of B, C, N, F, P, S, Cl, As, Se and Br.

Claim 15 (Withdrawn): The method of manufacturing a semiconductor device according to claim 13, wherein said impurity ions are selected from the group consisting of B, C, N, F, P, S, Cl, As, Se and Br.

Claim 16 (Withdrawn): The method of manufacturing a semiconductor device according to claim 14, further comprising:

forming a gate oxide layer from the insulating layer; and
forming a gate electrode from the conductive layer.

Claim 17 (Withdrawn): The method of manufacturing a semiconductor device according to claim 15, further comprising:

forming a gate oxide layer from the insulating layer; and
forming a gate electrode from the conductive layer